

FATAL INJURIES AT WORK

MASSACHUSETTS FATALITY UPDATE, 2005

Occupational Health Surveillance Program Massachusetts Department of Public Health September 2007

Every year, men and women in a wide variety of jobs and industries throughout Massachusetts are fatally injured at work. These deaths are all the more tragic because they are largely preventable. Information about where and how they occur is essential in order to develop effective prevention programs. In Massachusetts, the Occupational Health Surveillance Program (OHSP) in the Massachusetts Department of Public Health (MDPH) collects information on fatal occupational injuries as part of the national Census of Fatal Occupational Injuries (CFOI), conducted in cooperation with the Bureau of Labor Statistics (BLS), US Department of Labor.

OHSP also conducts in-depth investigations of fatal occupational injuries as part of the national Fatality Assessment and Control Evaluation (FACE) project, sponsored by the National Institute for Occupational Safety and Health (NIOSH). The purpose of the FACE project is to develop a detailed understanding of how fatal injuries occur and to identify effective countermeasures to prevent similar incidents in the future. Excerpts from selected FACE investigations are highlighted in this report.

This update provides an overview of fatal injuries at work that occurred in Massachusetts during 2005. These include fatalities traditionally linked to the work environment such as falls, electrocutions, and exposure to toxic chemicals. They also include workplace homicides and suicides as well as motor vehicle-related fatalities that occurred during travel on the job. Deaths resulting from occupational illnesses and heart attacks at work are excluded from this fatality update.

OVERVIEW OF FATAL INJURIES AT WORK IN 2005

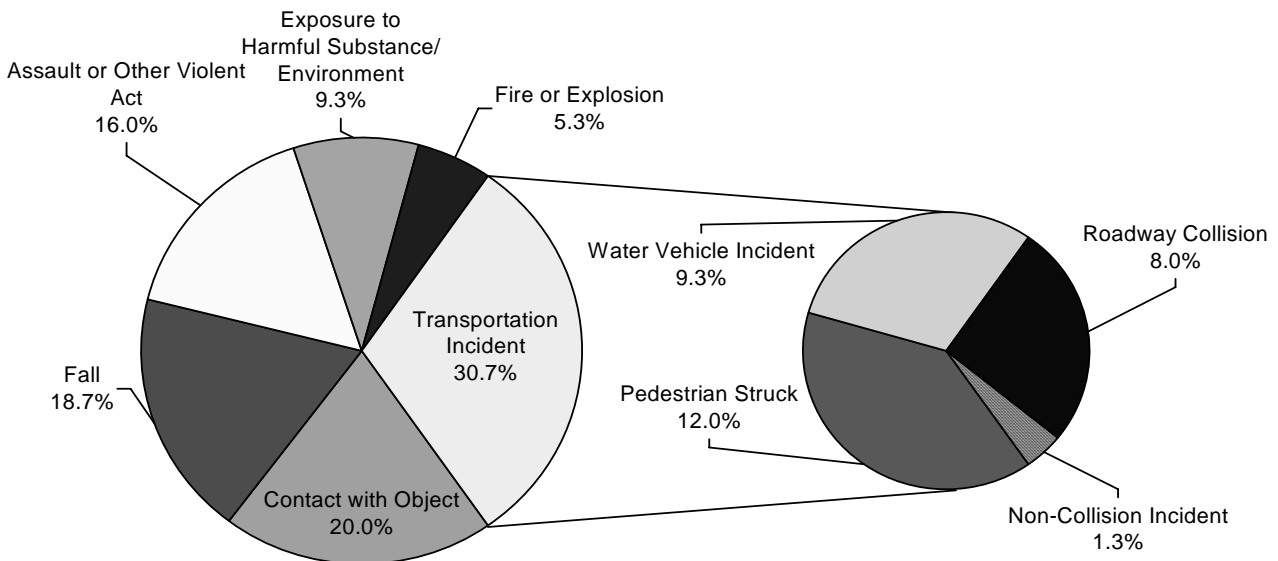
- In Massachusetts, 75 individuals were fatally injured at work during 2005; 69 were men and six were women.¹ The annual rate of fatal occupational injury in Massachusetts for 2005 was 2.3 deaths per 100,000 workers. This rate is similar to fatal occupational injury rates for Massachusetts reported for the previous two years.
- The victims ranged in age from 21 to 75 years, with an average age of 44 years. The 75 fatalities resulted in a total of 2,315 potential life years lost, an average of 31 potential life years lost per death. Potential life lost is the difference between the victim's age and 75 years.
- Fifty-seven (76%) victims were White non-Hispanic; six (8%) victims were Black non-Hispanic and 4 (5.3%) were Asian non-Hispanic. Six victims (8%) were Hispanic, four of whom were foreign born. The rate of fatal occupational injury among White non-Hispanics was 2.1 deaths per 100,000 workers. The rate among Black Non-Hispanic workers was 3.8 deaths per 100,000 workers, and the rate among Hispanic workers was 2.9 deaths per 100,000 workers.
- Twenty-two victims - approximately one in four workers fatally injured at work in 2005 - were born outside of the US. Six of these workers were from Central or South America, five from Africa, four from Asia, and three from Southern Europe. Foreign-born victims worked in a range of industries. The rate of fatal injury among foreign-born workers was 4.0 per 100,000 workers compared with the rate of 1.9 deaths per 100,000 workers for US-born workers.
- Of the 75 workers fatally injured, 15 were self-employed.² The fatal injury rate among self-employed workers was 4.7 deaths per 100,000 workers while the rate among wage/salary earners was 2.1 deaths per 100,000 workers. One-third (33%) of the self-employed victims were working in the construction industry as compared with one-fifth (20%) of the wage/salary earners.
- Thirty-four (45%) victims worked in small employer establishments (with 10 or fewer employees). Eleven (32%) of those victims worked in construction, nine of whom were fatally injured at residential construction sites.

¹ 75 work-related deaths in 2005 were identified as of 1/1/07.

² Self-employed workers included 2 persons who worked in family businesses.

EVENTS RESULTING IN FATAL INJURIES

**Figure 1. Fatal Injuries at Work by Event/Exposure
Massachusetts 2005, N = 75**



Source: Massachusetts Census of Fatal Occupational Injuries

Transportation-related incidents accounted for 23 (30.7%) deaths. These incidents involved workers in a wide variety of industries including fishing, transportation & material moving, protective service, and construction/extraction. Nine victims were pedestrians struck by vehicles in roadways, parking lots, or off-road areas. Four of these nine fatalities involved workers being hit by vehicles that were moving in reverse at loading docks or platforms. Six workers were vehicle occupants who were fatally injured in roadway collisions. Seven of the remaining eight transportation-related fatalities involved fishing vessels that capsized/ sunk /caught fire or involved fishers falling overboard.

Contact with objects or equipment claimed the lives of 15 (20%) workers. Six workers were fatally injured in the operation of material handling and processing machinery such as milling machines, conveyor belts, cranes, elevators, excavators and chippers; five were pinned in or under vehicles and one was crushed under a jacked house.³ Additionally, two workers were crushed in separate incidents by falling granite slabs.³

Falls resulted in 14 (18.7%) workers' deaths. **Falls to a lower level** accounted for the majority of these fatal falls, claiming 12 workers' lives and resulting in more fatalities than any other single event in 2005. These included four falls from scaffolds/girders, two from roofs, two through openings in roofs or floors, and two from stationary vehicles.³ One-half (6/12) of fatal falls to lower levels were from heights of 20 feet or less (Range: 6 to 53 feet).⁴

Assaults and other violent acts accounted for 12 (16%) of the work-related deaths; five were workplace homicides and six were suicides at work. Four of the five homicide victims were killed while tending retail establishments. Three of these retail workers were slain during robbery attempts and the fourth victim was killed by a co-worker.³ Workplace homicides accounted for almost 3% of all homicides among working age residents of Massachusetts in 2005.⁵

Exposure to harmful substances or environments resulted in the deaths of seven (9.3%) workers. Three workers succumbed to carbon monoxide poisoning, two of whom were working together in the vicinity of a gas-powered generator.³

An additional four (5.3 percent) workers perished in **fires or explosions**. Two of the fatal fires were ignited by substances that victims were applying to surfaces, a lacquer sealant on a hardwood floor and waterproofing chemicals on basement walls.³

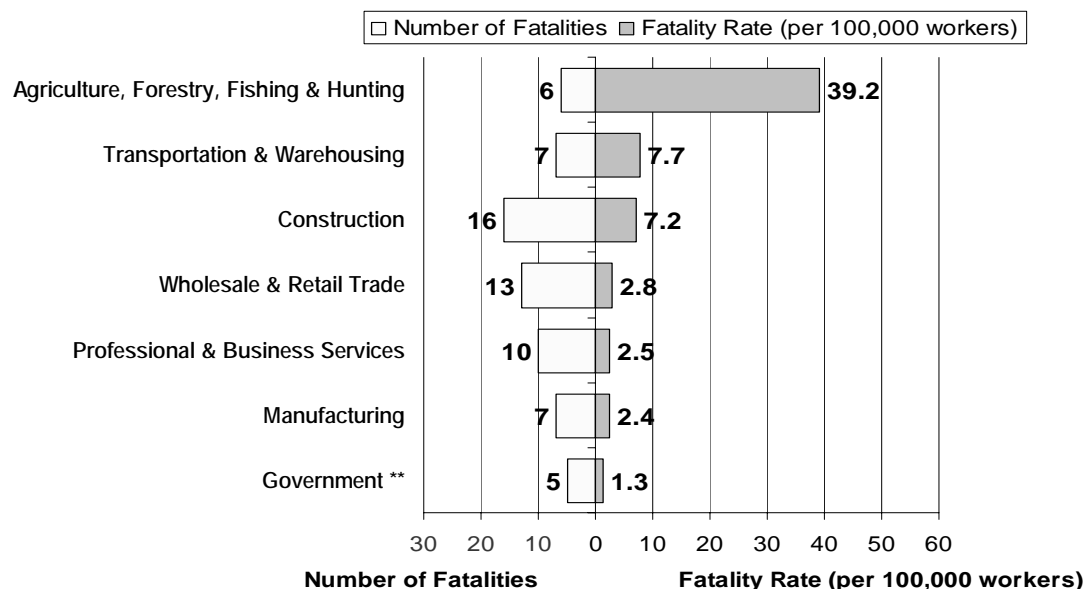
³ Data provided by the Fatality Assessment and Control Evaluation (FACE) Project, Massachusetts Department of Public Health.

⁴ Height information was not available for one fatal fall to a lower level.

⁵ National Violent Death Reporting System, 2005 Massachusetts provisional file, Injury Surveillance Program, Massachusetts Department of Public Health.

FINDINGS BY INDUSTRY

Figure 2. Number and Rate⁶ of Fatal Injuries at Work by Industry Division⁷
Massachusetts 2005



Note: Data not presented for five industry divisions with fewer than five fatalities.

**The Government category includes fatalities sustained by public sector workers regardless of industry.

Source: Massachusetts Census of Fatal Occupational Injuries

The **Agriculture, Forestry, Fishing & Hunting** industry had six (8%) fatalities and the highest occupational fatality rate (39 deaths per 100,000 workers) during 2005. Five of the six victims in this industry sector were commercial fishers and accounted for ten percent of the nation's fishing-related fatalities. The **fishing** industry alone had the highest occupational fatality rate in the Commonwealth with more than 130 deaths per 100,000 workers in 2005.

The **Transportation and Warehousing** industry had seven (9%) fatalities. Four of these seven deaths involved pedestrians (truck or cab drivers) being struck by vehicles in or near the roadway or at a loading dock.

The **Construction** industry had the highest fatality count with 16 (21%) deaths and the third highest occupational fatality rate (7.2 deaths per 100,000 workers). More than half (56%) of construction worker deaths occurred among small contractor firms with 10 or less employees that were working in residential sites. Six construction workers died as a result of falling from heights. Two workers perished in separate incidents at sites of publicly-funded building projects.³

The **Trade** industry had 13 (17%) deaths with a fatality rate of 2.8 deaths per 100,000 workers. Of the victims, eight were employed in retail and five worked in wholesale trade. Four of the five deaths in retail trade were homicides.

Ten workers employed in the **Professional & Business Services** industry were fatally injured at work in 2005. This is a broad industry division that includes, for example, waste management/remediation, employment and facilities management and scientific and technical services. The ten victims included three workers in waste management/remediation, three janitorial workers, and two landscapers.³ Five of the workers died as a result of being caught in or compressed by machines, structural/building materials, or vehicles.

⁶ To maintain consistency with denominator data, fatalities among military personnel (0) and workers under 16 years of age (0) were excluded from the numerator in rate calculation.

⁷ Industry definitions based on the 2002 North American Industry Classification Structure (NAICS), The Office of Management and Budget.

The **Manufacturing** industry claimed the lives of seven workers. Five of these victims were born outside of the US.

Five state and local **Government** workers sustained fatal injuries in 2005. Three of these five fatalities were among police, fire or other protective service personnel.

Landscaper Dies Inside the Hopper of a Truck-Mounted Pneumatic Blower - Massachusetts Massachusetts FACE Report 05MA074

A 23-year-old male landscaper was fatally injured when he became entangled in rotating parts of a truck-mounted pneumatic blower. Prior to the incident, the victim had just finished clearing a jam from the pneumatic blower's hopper and given his two co-workers the "thumbs up" sign indicating that the jam was cleared. The co-workers had restarted the material blower and continued with their task when the pneumatic blower once again jammed. Co-workers shut down the truck again, but this time they were unable to locate the victim. One of the co-workers climbed up to the top of the hopper to clear the jam and found the victim entangled in the agitators and augers. The victim had worked for the company for less than one year. The company had a health and safety program that included general information on lockout/tagout. The company provided employees classroom and on-the-job training.

To prevent similar incident Massachusetts FACE recommended that employers should:

- 1) **conduct routine hazard assessments of machinery to identify potential hazards to which workers are exposed;**
- 2) **ensure machinery is operated in accordance with manufacturers' specifications; and**
- 3) **develop, implement, and enforce a comprehensive safety program that includes the following: procedures for hazardous energy control (lockout tagout) for specific machines; procedures for work in confined space; employee training on these procedures and on general hazard recognition and the avoidance of unsafe practices and conditions.**

Manufacturers of pneumatic blower equipment should consider installing grid-shaped guards with interlocks at the top of hoppers and over augers. Ladder locks to prevent unqualified workers from accessing the top of the hopper should also be installed if feasible.

OSHA ENFORCEMENT AND PENALTIES

The Occupational Safety and Health Administration (OSHA) investigated 33 (44%) of the fatal work-related injuries that occurred in Massachusetts during 2005. Almost two-thirds (63%) of the 42 remaining fatalities were in workforce groups that fall outside of OSHA jurisdiction such as commercial fishers, public sector employees, sole proprietors, or the self-employed. The remaining one-third involved events not routinely addressed by OSHA such as homicides, suicides, airplane/railway incidents, or roadway motor vehicle-related collisions.

OSHA levied fines for violations of health and safety standards against 29 of the 32 employer establishments they investigated.⁸ In 2005, the agency assessed a total of \$506,950 in initial penalties, with the lowest fine assessed at \$1,500 and the highest at \$152,500.

⁸ One establishment that OSHA fined had one incident that resulted in two fatalities in this time period.

COMMENTS

It is important when reporting summary information about fatal occupational injuries to acknowledge the individuals that these numbers represent. These deaths were tragic incidents that were largely preventable. The surveillance findings presented here are intended to guide government, industry, labor, and community organizations in developing and implementing strategies to prevent similar tragedies in the future.

Nationwide, 5,702 workers died as a result of traumatic work-related injuries in 2005, and the annual rate of fatal occupational injury was 4.0 deaths per 100,000 workers.⁹ This rate is substantially higher than the annual rate of 2.3 deaths per 100,000 workers for Massachusetts. The lower fatality rate in Massachusetts is explained in part by differences in the industrial composition of the Commonwealth's workforce as compared with that of the nation. Nationwide, proportionately more workers were employed in high risk industries such as agriculture, mining and heavy manufacturing. Also, in 2005, Massachusetts had lower overall rates of fatal highway transportation incidents and homicides, two events that contributed substantially to the national occupational fatality burden. Fatal occupational injury rates computed excluding homicides and highway-related deaths reduced but did not eliminate the gap between the state and national rates (2.0 deaths per 100,000 Massachusetts workers verses 2.6 deaths per 100,000 U.S. workers).

Continued efforts are needed to reduce the human and economic toll of preventable deaths at work in the Commonwealth. Findings in this update highlight several specific issues to be addressed.

Two deaths in 2005 due to falling granite slabs highlight an emerging problem. Four additional workers in the **cut stone or stone distribution industry** were fatally injured in New England between August 2004 and April 2006. The Massachusetts FACE project has developed and disseminated a stone slab Hazard Alert to employers, unions, community organizations and health and safety professionals throughout Massachusetts (The English version of this Alert is on Page 7. Full sized, color copies of the Alert in both English and Portuguese are available; refer to the contact and material request information on the next page.) OSHA is currently focusing outreach, education and enforcement efforts on companies involved in the manufacture and handling of granite or other stone counter tops through a Regional Emphasis Program in New England. Additionally, OSHA developed a safety and health information bulletin addressing the hazards associated with the handling and transport of stone slabs, available at www.osha.gov/dts/shib/shib090805.html.

The **construction industry** in Massachusetts has continued to have both high numbers and high rates of fatal occupational injuries over time. In 2005, more than half of the construction industry deaths were among workers employed by small contractors with 10 or fewer employees who were working at residential sites. One-third of all construction deaths were due to falls. Innovative efforts are needed to reach these employers and workers, as well as homeowners who employ them. Massachusetts FACE disseminates fall prevention materials in multiple languages through local building permit offices and is currently facilitating discussions among stakeholders representing labor, insurers, academic researchers, community organizations and other government agencies, to identify and collaborate on strategies to reduce falls in construction. The Massachusetts Division of Safety has developed a fall prevention poster targeting construction activities and is disseminating it to building inspectors and employers (www.mass.gov/dos/consult/outreach/2006-03_fall_poster.pdf).

The exceptionally high rate of fatalities in the Massachusetts **fishing industry** is consistent with the high rate among commercial fishers reported for the country as a whole (118.4 deaths per 100,000 workers).¹⁰ In 2005, Massachusetts had the third largest number of fishing-related fatalities nationally, following only Alaska and Florida.⁸ The commercial fishing industry is vital to the economies of Massachusetts port towns such as New Bedford and Gloucester, generating revenues on par with or higher than Alaskan towns.¹¹ Deaths in this industry should not be considered inevitable. Massachusetts can learn from success in Alaska where efforts to expand safety training programs and increase adherence to safety standards have reduced the fatality rate among commercial fishers.

⁹ U.S. Department of Labor, Bureau of Labor Statistics, Census of Fatal Occupational Injuries, 2005.

¹⁰ National Census of Fatal Occupational Injuries in 2005 (2006), www.bls.gov/news.release/pdf/cfoi.pdf, U.S. Department of Labor, Bureau of Labor Statistics, Census of Fatal Occupational Injuries.

¹¹ Fishing Anchors the Economy (April 3, 2005), The Boston Globe.

The high fatal occupational injury rate among **foreign-born workers** should be interpreted with caution because it is based on a small number of deaths and imprecise Massachusetts workforce counts. However, it is consistent with national findings¹² and with the disproportionate concentration of immigrant workers in higher risk jobs. Other contributing factors likely include language, literacy, and cultural barriers at work, inexperience, and fear of discrimination and socioeconomic pressure that make workers hesitant to speak up about workplace hazards and safety concerns.^{12,13,14} Lack of information about health and safety rights and resources is also a likely factor. In a recent MDPH study based on interviews with over 1,400 community health center patients, 75% of patients born outside of the US had not heard of OSHA.¹⁵ The Massachusetts FACE project is collaborating with a number of community partners in Massachusetts to address the health and safety of immigrant workers such as the Coalition for Better Work Environment for Brazilians. Through the FACE project, the Massachusetts Department of Public Health is also collaborating with the Massachusetts Coalition for Occupational Safety and Health and the Vietnamese American Initiative for Development to reduce risks to Vietnamese workers employed in the floor finishing industry.

New Fact Sheet on Workers' Compensation Death Benefits Available

The Occupational Health Surveillance Program, in collaboration with the Massachusetts Department of Industrial Accidents, recently developed a fact sheet describing workers' compensation benefits for spouses and dependents of workers fatally injured at work. This fact sheet is available at www.mass.gov/Eeohhs2/docs/dph/occupational_health/next_kin_benefits.pdf.

A more extensive guide describing workers' rights and benefits under the Massachusetts workers' compensation system (in English, Portuguese, and Spanish) is available at www.mass.gov/dph/ohsp.

CONTACT / MATERIAL REQUEST INFORMATION

For detailed tables of fatal occupational injuries in 2005, previous fatality update reports as well as FACE Facts and Safety Alerts, please contact the Massachusetts Department of Public Health, Occupational Health Surveillance Program, 250 Washington Street, 6th Floor, Boston, MA 02108-4619. Reports are available online at www.mass.gov/dph/face or by calling 1-800-338-5223.

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¹² Loh K., Richardson S. (June 2004), Foreign-born workers: trends in fatal occupational injuries, 1996-2001, Monthly Labor Review, 127:42-53.

¹³ Frumkin H. Pransky G. (1999), Special Populations in Occupational Health. Occup Med: State of the Art Reviews, 4(3):479-84.

¹⁴ Azaroff L. Levenstein C. Wegman D. (2002), Occupational Injury and Illness Surveillance: Conceptual Filters Explain Underreporting, Am. J Pub Health, 92(9): 1421-29.

¹⁵ Occupational Health and Community Health Center Patients: a report on a survey conducted at five Massachusetts CHCs (2007), Occupational Health Surveillance Program, Massachusetts Department of Public Health.

FACE Facts

FATALITY INVESTIGATION REPORT

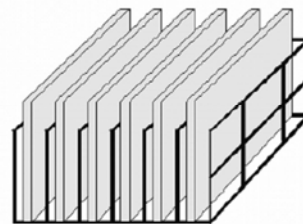
Occupational Health Surveillance Program
Massachusetts Department of Public Health
December 2006



Worker Killed When Crushed by Multiple Granite Slabs — Massachusetts

Background: In New England, six workers in the cut stone or stone distribution industry have been killed between August 2004 and April 2006. As with most work-related injuries and fatalities, these deaths could have been prevented.

Incident: A Brazilian male granite worker was fatally injured while retrieving a granite slab located in a vertical slab rack. The granite slab was the second of five stone slabs stored in the rack's end storage section between one pair of support pins. In order to create enough room to hoist the second slab out of the rack, the victim positioned himself with his back facing the first stone slab. With help from a coworker, the rack's end support pins were removed and the first stone slab was tilted away from the granite slab and onto the victim's back for support. The remaining four slabs that were located in the rack's end storage section started to tilt. All five stone slabs, weighing over 5,700 pounds, fell and fatally crushed the victim against a stone table and injured the coworker.



Slab rack with fixed support pins and individual compartments for each slab.

Recommendations

To reduce crushing hazards when storing and retrieving stone slabs:

- ♦ Use slab racks with fixed support pins and individual compartments for each slab.
- ♦ Never disassemble any portion of a slab rack that is storing slab materials.
- ♦ Ensure all slab racks are designed by registered professional engineers and load capacity documentation is available in the workplace.
- ♦ When available, use material handling equipment, such as gantry cranes or forklifts, with proper attachments, to lift and move slabs.
- ♦ Never stand under or next to slabs that are being moved.
- ♦ Never manually support large stone slabs.
- ♦ Always stand at the ends of stone slabs.
- ♦ When using racks that hold more than one slab in a section, ensure that:
 1. Slabs are placed in racks by height.
 2. Rack sections are never overcrowded with stone slabs.
 3. All slabs stored in the rack are tied down.

In addition, employers should:

- ♦ Develop, implement, and enforce a comprehensive written safety program, which includes standard operating procedures (SOPs) for receiving, storing and retrieving stone slabs.
- ♦ Provide training to employees on these SOPs and about hazard recognition and avoidance of unsafe work conditions.

Please report work-related fatalities immediately to the
Toll-Free Occupational Fatality Hotline

1-800-338-5223

or

Fax 617-624-5696

When reporting a fatality, include the following information:

- Your name, organization, address, and phone number
- Victim's name, occupation, and employer
- Brief description of the incident, including date and time

The Occupational Health Surveillance Program would like to thank all agencies and people that contribute to our efforts in preventing work-related deaths by reporting fatalities and providing information during our fatality investigations.

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